PART 1 GENERAL

1.01 SCOPE

Design, fabricate, assemble and transport and offload to the project site a precast concrete equipment shelter complete with interior finish materials, exterior door, frame and hardware, HVAC units, electrical equipment, light fixtures, EG and auxiliary equipment, Intake and EG Exhaust Ductwork and exterior rain hoods at door. The shelter shall be pre-assembled, completely dust and water-tight and shop-fabricated with required appurtenances. A foundation drawing shall also be required as part of the building package. Conduits shall come up from the floor through pre-formed block-outs as noted in drawings. The block-outs in the floor will be oversized, but aligned with respect to the interior panels that will be provided in the precast shelter.

The location of the ESF RCAG is a small hilltop on the north side of Esler Field Airport in Pineville, Louisiana.

1.02 SYSTEM DESCRIPTION

The equipment shelter shall be pre-equipped, constructed with two halves and each halve shall be complete as possible when transported to the site (two each sections, 12' x 36'). The two halves shall be joined together at the site. All electrical, grounding, lighting, cable trays and 4" x 4" AC/DC wireway runs and wiring shall be immediately completed at site after offload. The floors, walls and roof will be pre-cast concrete panels with a minimum thickness of 4". Overall nominal exterior dimensions shall be 24'wide x 36'long x 9' feet tall.

Drawings that detail this precast building are the following <pdf files>

ESF-D-RCAG-G001 Cover Sheet
ESF-D-RCAG-C001 Site Layout
ESF-D-RCAG-C003 Building Interior Layout
ESF-D-RCAG-C004 Front and Back Views of Precast Building
ESF-D-RCAG-C005 Sideviews of Building – EG ext. wall
And Electronic Room wall
ESF-D-RCAG-E002 EG One-line diagram and GFM listing
ESF-D-RCAG-E003 Panel Schedule and Grounding
ESF-D-RCAG-E004 RCAG Lighting Plan
ESF-D-RCAG-E005 Cable Tray and AC/DC Power Wireways
ESF-D-RCAG-E006 Electrical Detail for Telco
ESF-D-RCAG-E007 Electrical Grounding Plan for Counterpoise
ESF-D-RCAG-E008 Roof Conductor/Air terminals
ESF-D-RCAG-E011 Auxiliary EG Equipment Wall views

ESF-D-RCAG-E012	Power and Control Schematic for EG Auxiliary
ESF-D-RCAG-E013	EG Power panel
ESF-D-RCAG-E014	EG Conduit and Cable Schedule, Single Phase AC
ESF-D-RCAG-E015	EG Power, Control, Indication and Grounding Wiring
ESF-D-RCAG-E016	EG CLIN 105.8 Auxiliary Diagram/Wiring
ESF-D-RCAG-E017	ATS CLIN 771 Interconnection Diagram
ESF-D-RCAG-E018	Load bank CLIN 253 Interconnection Diagram
ESF-D-RCAG-E019	Battery Charger and Block Heater Interconnection Diagram
ESF-D-RCAG-S001	RCAG Foundation
ESF-D-RCAG-M001	Mechanical Floor Plan
ESF-D-RCAG-M002	Mechanical – Muffler and View of EG Set-up
ESF-D-RCAG-M003	Kohler Dimensions of EG
ESF-D-RCAG-M004	Intake Hood Detail
Figure 7-9	Generator Set Connections, Typical
Figure 14	Battery Charger Dimension Drawing
Figure 17	Battery Charger Schematic and Interconnection
GM 19505D	Kohler Load Bank
AB-B-1714-1 to 10	Gas Detector Drawing Package <1 through 10 Sheets>

1.03 QUALITY ASSURANCE

Cracks, chips, etc that do not affect the structural integrity of the racked member will be repaired for aesthetic purposes and conform to ACI 224.1R-84 or equivalent. Repairs shall not be visually distracting at a distance of 5 feet and shall be watertight. Any structural integrity issue may be subject to rejection by the Federal Aviation Administration upon investigation by Contracting Officer and the FAA Project Engineer along with Fabrication company representative.

1.04 SUBMITTALS

A. Provide submittal of shop drawings, product data and samples.

B. Design data: Submit complete and specific design data for products specified. Two sets Professional Engineer stamped drawings of the design shall be supplied. The drawing shall include minimum of finished interior details, shelter layout, list of materials, and electrical schematics. Electronic drawings shall be provided to the FAA (minimum PDF). Electronic layout drawing (specifically one drawing) will be Autocadd or Microstation format to allow FAA to modify/add/show radio and other electronic equipment inside the shelter.

C. Product data:
1. Submit document to evidence compliance with specifications.

2. Manufacturer's product data shall be clearly marked to indicate specific models or types for submittal and FAA approval.

1.05 DELIVERY, STORAGE AND HANDLING

A. Transportation to shelter's final destination shall be accomplished with a tractor trailer combination designed to haul over-width, over-height and over-weight loads to remote sites per DOT and State regulations.

B. A crane shall be provided by the CONSTRUCTION CONTRACTOR to off-load the shelter to the foundation. Shelter shall be off-loaded directly to the foundation under supervision by the precast shelter fabricator. The CONSTRUCTION CONTRACTOR will pay for the crane, but the manufacturer shall be notified of shipment to site and coordinate all travel, shipment, hauling and completion work for interconnecting electrical, finishing out the building, sealing/making weatherproof and installing of HVAC units, etc. as required to provide a complete precast shelter.

PART 2 PRODUCTS

2.01 A. Reinforcement: Rebar shall conform to ASTM A615 Grade 60 and ACI 318-89. Welded wire fabric shall conform to ASTM A185 (fy = 60000 psi) and ACI 318-89.

B. Cement: Portland cement shall conform to ASTM C-150 type I or type III. Cement shall be free from deterioration or contamination.

C. Aggregate: Sand shall conform to ASTM C33. Lightweight coarse aggregate shall conform to ASTM C330. Coarse aggregate shall be ¾" nominal maximum size. Aggregates shall be free from deterioration or foreign matter.

D. Water: Mixing water shall be potable, clean and free of oils, acids, alkalis, salts, organic materials or other substances harmful to concrete and reinforcement.

E. Admixtures: Air entraining admixtures will conform to ASTM C260. Water reducing admixtures will conform to ASTM C94.

F. Concrete:

1. Design mix for compressive strength of at least 3500 psi at 7 day and 5000 psi at 28 days.

2. Concrete shall have a slump not to exceed 3" before addition of super plasticizer.

3. Concrete shall have 3% to 6% entrained air.

4. Sample strength tests shall be provided to the FAA upon request. Tests shall verify 7 day, two 28 day and one spare. Testing shall be in accordance with ASTM standards C31, C172 and C39.

5. Concrete shelter shall be cured and protected from moisture loss, freezing and excessive heat until compressive strength reaches the required minimum.

6. Cover for reinforcing steel shall be in accordance with ACI 318-89.

2.02 FABRICATION

A. Structural Loading:

1. Floor: Shall be designed to support a minimum live-load of 240 psf when supported be perimeter beam foundation.

2. Roof: Shall be designed to support a minimum live-load of 140 psf for spans up to 12 feet wide.

3. Wind: The shelter shall be designed to withstand 150 mph winds.

4. Seismic: The shelter shall be designed to meet or exceed seismic zone 2 requirements.

B. Resistances:

1. Fire: The shelter exterior walls shall have a one-hour fire rating as described in the latest Uniform Building Code.

2. Weather: The shelter shall be completely weatherproof. Each structural panel shall be impregnated with a chemical moisture barrier to prevent seepage and enhance the exposed aggregate finish. All panel joints (wall-to-ceiling, wall-to-wall and wall-to-floor) shall be sealed with a permanent no caulk weather seal. Horizontal joints shall utilize a step-joint detail to prevent water penetration and be sealed with pre-compressed expanding sealant tape. Vertical joints shall be sealed with a neoprene O-ring gasket that are compressed into

matching grooves in each panel in addition to the expanding sealant tape. The doorways shall include step-joint threshold and a drip cap over the top of the jamb to prevent water from entering the shelter. The door frame will be of one-piece construction and cast into the concrete to prevent moisture from causing corrosion behind the frame.

C. Panel Connections: Panel to panel connections shall be a bolted or welded connection using plates and anchors that are cast into the floor, roof and wall panels. Steel plates and shapes shall conform to ASTM C36. Welding shall conform to AWS D1.1 and AWS D1.4. Panel construction shall conform to ACI 318-89.

D. Floor: Shall be a "T-beam" design. It shall contain provisions for lifting the shelter and securing it to the foundation.

E. Walls: 4" thick (per ACI 318-89), flat, concrete panels with WWF 4" x 4" and additional reinforcement along panel edges, around door opening and AC locations. Outside wall panels shall be exposed aggregate. Panels can have insulation cast into panels for added insulation and reduction in weight.

F. Architectural:

1. Exterior finish: The aggregate finish shall be an aesthetically pleasing and uniform in pattern and color. The smooth vertical roof and floor surfaces shall be finished with a contrasting, textured gray paint.

2. Door: The shelter shall have two each double door, 18 gauge, galvanized steel doors, 72" W x 84" H, painted tan, and insulated with a urethane core (minimum R-12). The door will have tamper-proof 26D finish hinges, a mortise lock set with built-in dead bolt lock that accepts a BEST lock cylinder, a drip cap, a threshold, and adjustable weather stripping.

3. Frame: A 16 gauge, steel, galvanized and primed door frame shall be cast in place into the wall panel for security, improved resistance to weather, and painted to match door.

4. Interior finish: The interior walls and roof shall be insulated and finished with fiberglass-reinforced plywood (FRP) paneling and white vinyl trim at all joints.

5. Floor: Electronic Equipment/Radio room -The floor shall be covered with gray, vinyl, composition tile, 1/8th inch thick, conforming to Federal Spec SS-T-312B(1), Type IV, composition 1. The vinyl tile must not contain asbestos.

Engine Generator room – The floor shall have epoxy garage floor paint. Use Seal Krete Epoxy-Seal, light gray (Armor grey) color or Sherwin-Williams Pro Industrial High Performance Epoxy or approved equal product.

6. Insulation: Wall insulation shall be R-11, ceiling shall be R-16 according to ASHRAE Standard 90. The shelter supplier shall produce calculations showing the corrected U-value for the assembly. Insulation shall be concealed behind the interior architectural paneling and be in accordance with Federal Spec HH-1-1972/1 and UL class A.

G. Roofing: Shall be 4" thick, minimum concrete, flat, panel roof. Reinforcement shall be provided for structural width and loading requirements. Minimum pitch of roof will be 1/4" per foot.

The roof shall be completely sealed with an elastomer type roof membrane.

H. Mechanical/HVAC system: Shelter shall have two vertical, wall-mounted air conditioners. Unit shall include a time-delay start-up relay, low ambient control, and a forced-air resisitive heating strips. Unit shall be two each 2 Ton, Bard or equal units with 4 KW heat strips. Provide Supply and return air grills. Provide lead-lag controller compatible to units.

I. Electrical system:

1. General: Shall meet the National Electrical Code (NEC) and equipment shall be UL listed or equivalent.

2. Electrical work shall also meet or exceed FAA Specifications 1217F and FAA-STD-019e.

3. System:

a. The electrical system will consist of a 200 Amp rated, single phase 120/240 VAC heavy duty service disconnect switch on the inside of the building with 125 amp fuse.

b. Install three forty-two circuit load center.
Panel "EG Room" will have a 125 Amp main breaker. Circuit breakers shall be provided for various Engine Generator auxiliary equipment as noted in the mechanical and electrical drawings for the GFM Propane Engine Generator package CLIN 105.8

There are two panels in the Electronic Room. One is for general equipment, lights and outlets and is called Panel "A". It will have a 100 Amp Main Circuit Breaker. This panel is the primary power panel for all outlets, lights and other ancillary equipment for the building. The other panel is the "Electronic/Radios" Panel. . Panel "A" shall feed Panel "Electronic/Radios" Panel through a 100 Amp circuit breaker.

c. The "Electronic/Radios" panel is the secondary forty-two circuit load center with lugs only and shall be for FAA electronic equipment only (radio, back-up DC battery system) Two 30 Amp, double-pole breakers are for two battery back-up systems. The rest of the panel shall be filled with single-pole 20A breakers. The panel shall be completely filled for future use with 20 amp breakers.

d. Legend of breakers will only be filled on electrical use by the shelter manufacturer for AC, lights and outlets. Leave unused breaker blank. Do NOT write/print anything on legend about "future" or "blank".

e. Each exterior wall shall have a single 150 Watt Wal-pack metal halide fixture. Exterior light fixtures will have a separate wall switch . Front light fixture shall have photocell for automatic lighting and be on a separate circuit.

f. Install multiple interior fluorescent light fixtures with two 40 Watt bulbs to produce 70 foot-candle illumination for the engine generator and electronic room.

g. Duplex receptacles, 20A rated, every 12 linear feet, or less.

h. Exterior duplex receptacle, 20A near the two AC vertical units for service/maintenance/lighting purposes.

i. Antenna patch cabinet shall be Hoffman model C-TD364812 or equal, 36" H x 48"W x 12"D, double door with white painted ¾" birch plywood backboard. Backboard is significant for electronic equipment, cable and ease of mounting electronic equipment. Cabinet shall have door handles.

j. Surge arrester by EFI Electronics or equal Titan 250MP, 250K Amp panel protection or RayVoss 120-2S-N1-3-06-A StrikeSorb 80 rated at 200K Amp strike.

k. Six ground bars per FAA standard (one main, two multi-point and three single-point)

l. The FAA is providing a Bill of Material List for the Engine Generator room to the manufacturer of the precast building, Government Furnished Material. The Bill of Materials is on sheet E002. The Manufacturer of the pre-cast building shall install all conduits and circuits to the maximum extent possible for the EG system prior to shipment. The Manufacturer shall install the Load Bank, Gas Detector, EG to the floor with proper seismic isolators (see Sheet M002), Automatic Transfer Switch, battery charger control panel and load bank control panel. Circuit control, indicator, power and lighting conductors shall be rolled at end of conduits or junction boxes and left unconnected until the two precast building halves are set. Once the building is set, the conduit runs shall be completed and circuit conductors shall be terminated at auxiliary equipment <battery charger, load bank controller, "EG" power panel, Automatic Transfer Switch (ATS), Gas Detector, and EG Emergency Stop Switch (see Drawing E012 for auxiliary equipment interconnection diagram).

The Precast Building Manufacturer shall not be responsible for the fuel runs, vaporizer or piping or any grounding runs that involve the counterpoise (exterior underground ring). The Manufacturer shall not provide or be responsible for Eye Wash Station.

The muffler, silencer, and exhaust stack for the EG will be completed by the CONSTRUCTION CONTRACTOR.

The Manufacturer shall install UH-1 (EG room heater), EF-1 and EF-2. The Manufacturer shall install EG Air Intake. The manufacturer shall install the Gas Detector Macurco GD-2A (Government Furnished) and install intake and exhaust hoods for EG

Note: the FAA will consider options on the completion of the above EG system by the MANUFACTURER. The options shall be defined and offered to the FAA and the FAA shall respond to accommodate a smooth transition in completing the system by the CONSTRUCTION CONTRACTOR and to ensure a satisfactory and operational EG system.

J. Cable ladder/wireway: Cable ladder shall be B-Line or equal, 18" aluminum, 4" deep. Each section of cable tray ladder shall be bonded with a #6 green stranded wire and a 2 hole long-barrel lug. Mount cable ladders 92" above finished floor.

Electrical 4" gutter shall be bonded per section as noted for cable tray and is for electrical power (one is DC and the other is an AC gutter wireway).

PART 3 EXECUTION

CONSTRUCTION CONTRACTOR shall provide off-loading and immediate setting of shelter with crane and supervision. The PRECAST BUILDING MANUFACTURER though will provide precast completion crew after setting the building. The completion work includes as a minimum electrical work, cable tray, 4" square duct, grounding and weatherproofing of the two pre-cast halves after setting the building on the foundation. The manufacturer shall stay as required overnight in nearby Pineville or Alexandria, Louisiana to complete the weatherproofing, interconnection of light circuits, EG auxiliary equipment, aluminum cable trays, AC and DC 4" gutter, interior wall and floor finish to cover the floor gap with appropriate aluminum plates and FRP paneling for the wall gaps. The completion work period by the Manufacturer shall be stated in the proposal and shall not exceed three workdays. If more than three is required, the proposal shall state length of time needed.

The Manufacturer shall also provide a representative for the start-up and performance test of the Engine Generator. The CONSTRUCTION CONTRACTOR will coordinate this event with the Manufacturer and schedule this EG testing. For information, the EG testing will have a Kohler Representative/Technician present for the EG start-up and performance testing.